

REMARKS

Claims 4-13 are pending in this application. Claim 1-3 have been canceled. Claims 4-8 and 11-13 have been amended. No new matter has been introduced. The amendments to claims 4-8 and 11-13 also obviate the rejection of claims 12 and 13 under 35 U.S.C. §101, and the objection of claims 4-8 and 11 (for various informalities and improper format).

Applicants confirm the December 19, 2008 telephone election of Group II (claims 4-13) for continued examination, without traverse. Claims 1-3 have been canceled as non-elected claims.

Applicants concurrently submit an Information Disclosure Statement with copies of the non-patent literature that was not previously submitted or considered.

Claims 4-10, 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Verard ("*Fully automatic identification of AC and PC Landmarks on Brain MRI Using Scene Analysis*") and Sun ("*Anatomic Labeling of PET Brain Images with Automatic Detection of AC and PC*"). This rejection is respectfully traversed.

Amended independent claim 4 recites *inter alia*:

(i) "using the estimated position of the AC or PC landmark to generate one or more axial or coronal radiological images, including at least one image including the estimated position of the AC or PC landmark" and

(ii) "analyzing the axial or coronal radiological images to improve the estimate of the position of the AC or PC landmark."

Verard and Sun, considered alone or in combination, do not disclose or suggest all limitations of claims 4-10, 12 and 13. Specifically, Verard does not disclose or suggest either feature (i) or feature (ii) of claim 4. Verard discloses that the positions of the PC and AC landmarks are found using a step-by-step procedure performed on a midsagittal image (Verard, Fig. 2(b) caption). The section on "Localization of the PC and the AC" in Verard (which is cited by the

Examiner) merely discloses that the identification of the superior Co allows one to draw a small window B2 (in the midsagittal image, as shown in Fig. 2(b)) which includes the PC with certainty. Two convolution masks are then applied to the pixels located inside the window B2 to obtain a coarse localization of the PC and this coarse position is fine grained by applying a second matched filter inside a smaller region, centered on the previously found PC position (in the midsagittal image). The position of the AC is found by applying a similar process as was described for the PC. Clearly, Verard only teaches steps which operate on a midsagittal image and does not teach or suggest using the coarse localization of the PC to generate one or more axial or coronal radiological images. Therefore, Verard does not disclose or suggest feature (i) or feature (ii).

Sun fails to address the deficiencies of Verard. Sun is also silent about either feature (i) or feature (ii) of claim 4. In Sun (in particular Fig. 3 and the caption cited by the Examiner), the axial and coronal slices of AC and PC are only used for labeling with the help of Talairach's atlas, and are not used to improve the estimated position of the AC or the PC landmark. Indeed, Sun does not disclose or suggest that the axial and coronal slices can be used to improve the estimated positions of the AC or PC landmarks. Thus, Sun clearly does not disclose or suggest feature (i) or feature (ii) of claim 4.

By generating one or more axial or coronal radiological images from the estimated position of the AC or PC landmark and by analyzing these axial or coronal radiological images to improve the estimated position of the AC or PC landmark, the final positions of the AC or PC landmark can be found using information obtained from all the three orientations. The final estimated position of the AC or PC landmarks would therefore be more accurate. Such an advantage cannot be achieved by either Verard or Sun. For at least the reasons above, Verard and Sun, alone or in combination, fail to disclose or suggest the subject matter of amended independent claim 4 and of dependent claims 5-13, and the Office Action fails to establish a *prima facie* case of obviousness.

Further, claim 5 recites, *inter alia*, "deriving a mean ventricular line (MVL) and determining the position of the AC or PC landmark by scanning intensity values along the MVL."

As stated on page 12 line 29 to page 13 line 2 of the present application, for the AC reference slice containing the estimated position of the AC landmark and each of the four slices derived from it, a mean ventricular line (MVL) passing through the third ventricle is formed by using the horizontal and vertical projections of the corresponding slice. A MVL is also formed from the PC reference slice and the slices derived from it in the same manner (page 14, lines 13-15). Applicants submit that neither Verard nor Sun teaches or suggests such a MVL. Page 615, col. 1 line 24, column 2 lines 1-45 of Verard (as cited by the Examiner) merely discloses the mean of differences between automatic calculation and manual pointing of the AC and PC landmarks and the standard deviation for both axial and coronal angulations. Clearly, Verard does not disclose or suggest deriving a MVL and, certainly, does not teach or suggest determining the position of the AC or PC landmark by using a MVL. Therefore, in addition to claim 5 being allowable as depending on an allowable independent claim, the features of claim 5 further patentably distinguish this claim over the cited documents.

Claim 6 recites, *inter alia*, “axial slices including a first axial image of an axial slice containing the estimate of the AC or PC landmark ... second images of neighbouring axial slices ... determining dimensions of the AC or PC landmark using the second images.” As discussed above, neither Verard nor Sun discloses or suggests operating on axial slices including an axial slice containing an estimate of the AC or PC landmark. Therefore, in addition to claim 6 being allowable as depending on an allowable main independent claim, the features of claim 6 further patentably distinguish this claim over the cited documents.

Claim 7 recites, *inter alia*, “images are coronal images ... deriving a symmetry line within a first coronal image including the estimate of the position of the AC or PC landmark, and determining the position of the landmark by scanning intensity values along the symmetry line.” As discussed above, neither Verard nor Sun discloses or suggests operating on coronal images including a coronal image containing an estimates of the position of the AC or PC landmark. Further, Verard and Sun do not teach or suggest deriving a symmetry line and determining the position of the landmark using the symmetry line. The steps disclosed in page 613, column 2 of Verard (as cited by the Examiner) do not result in any symmetry line and are clearly meant for

obtaining a pseudo midsagittal image and not for determining the position of any landmark. Therefore, in addition to claim 7 being allowable as depending on an allowable main independent claim, the features of claim 7 further patentably distinguish this claim over the cited documents.

Claim 8 recites, *inter alia*, "images relating to different coronal slices including second images of coronal slices neighbouring the first coronal slice ... determining dimensions of the AC or PC landmark using the second images." As discussed above, neither Verard nor Sun discloses or suggests operating on coronal images including a coronal image containing an estimate of the AC or PC landmark. Further, neither Verard nor Sun discloses determining dimensions of the AC or PC landmark. Page 612, column 1 in Verard (as cited by the Examiner) merely discloses calculating parameters of an ellipse (which is used to model transaxial slices) to determine the axial misorientation angle which can in turn be used to identify the interhemispheric fissure from which the midsagittal plane can be constructed. Clearly, page 612, column 1 in Verard does not disclose determining dimensions of the AC or PC landmark. Therefore, in addition to claim 8 being allowable as depending on an allowable main claim, the features of claim 8 further patentably distinguish this claim over the cited documents.

In view of the above, Verard and Sun, alone or in combination, fail to disclose or suggest the subject matter of claims 4-10, 12 and 13, and withdrawal of the rejection of these claims is respectfully requested.

Allowance of all pending claims is solicited.

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